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DEMOGRAPHIC PROJECTIONS AND ECONOMIC PLANNING

By Dr. Miloš MACURA,
Director,
Demographic Research Centre,
Institute of Social Sciences,
Belgrade

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DEMOGRAPHIC PROJECTIONS AND ECONOMIC PLANNING

By Dr. Miloš MACURA

Director, Demographic Research Centre, Institute of Social Sciences, Belgrade

1. The purpose of this paper is to briefly discuss some basic issues concerning the demographic projections and their utilization in planning for economic and social development, with particular reference to the developing countries. As a recent field of applied economic research planning received increasing interest especially with its extension in the three following directions. First, many countries, particularly the less developed ones, have adopted planning as a rational method of formulating the economic and social policy and as an efficient instrument of its implementation. Second, due to the growing role of planning its methods and techniquas had bean steadily developed, diversified and improved there by enriching both practical experience and theory. Third, the scope of planning was gradually extended, too, so that almost all important fields of the economic and social life are at present incorporated into the plans for economic and social progress.

2. It is a very encouraging fact that the extension of planning did not overlook the population and its development. In their early stage, economic plans did not consider the population problems related to the economic and social development, nor did they assess the demographic effect in social-economic changes. Perhaps the economic and demographic theory were responsible for this neglect, in particular the Malthusian theory which emphasized the consumer's capacity of the population while completely overlooking the producer's capacity. Only recently the population problem received its more adequate position in economic planning and attempts are being made to integrate the demographic projections with other kinds of projections in a consistent and rounded planning methodology. As a matter of fact, the recent development in planning tends to work out appropriate methods and techniques for the elaboration of the plans which will, inter alia, foresee the demographic development (conceived as the growth and structural changes of the population) and its relationships with the economic and social progress.

3. Ten years ago the United Nations Population Commission had made recommandations with regards to improvement in existing knowledge of the relationships between population trends and economic and social conditions. Past population trends and social-economic changes had been a subject matter dwelt with by the commission, while in demographic projections and planning we are faced with the same problem concerning, however, the future. Obviously, it is not possible to make any forecast of the future economic, social and demographic development without a fair knowledge of the present facts and past trends. Projections of the future development have to be based on studies and analyses in past and recent changes. In fact we should understand as demographic projections needed for social and economic planning at least: a) analyses of the past trends, b) projections as such and c) analyses required for following-up the development anticipated.

. Two facts make the demographic projections complex and difficult. First, assumptions on future demographic development have to be based on existing knowledge concerning the inter-relationships and mechanism of demographic and social-economic changes as well as the philosophy of the development anticipated. However, the present knowledge in this field is insufficient so that the projecting work might be ~~based~~ due to inadequate assessment of the past and future relationships between the population and economy. This is the reason why research of demographic and social-economic changes is of a paramount importance for the projections, and why they have to start with recent trends studies. Second, demographic projections' methods and techniques are far from being complex and adjusted to the economic planning. Only population sex-age projections techniques had been tested in many countries and therefore seem to be generally adopted. Methods and techniques concerning other demographic projections are in an experimental stage and have to be proved by further experience. In addition, attempts have to be made to integrate the methods and techniques already in use for demographic projections and planning so as to obtain a more comprehensive planning methodology.

5. It is well known that the national peculiarities affect very much both economic and social planning and demographic projections to be worked out for planning purposes. Neither the objectives of planning, nor the present level of economic, social and demographic development, institutional framework and resources are the same in all countries. The availability of statistical data has also a serious influence in this respect. Therefore the content of demographic projections needed for planning cannot be the same in all countries, as well as the methods and techniques to be used for. Indeed, there are common characteristics of the population growth and structure in all the less developed regions. This is what gives some common characteristics to the demographic projections also, so that a national theory and methodology concerning the forecasting of future population might be a basis for international discussions. In this respect the Yugoslav experience in demographic projections might be of interest to other developing countries, particularly if the demographic, economic and social problems to be solved in the future are similar

THE SCOPE OF DEMOGRAPHIC PROJECTIONS

6. Traditional demographic projections had been limited to forecasts of the population size and growth only. This was in fact the pre-planning period of demographic projections, when the interest in future population was of a general and not of a specific economic nature. Later on sex and age structure estimates had been included in population projections, relating thus the dynamics of population growth to the sex-age structure changes. This was a great contribution, since the forecasts of the population growth had been "structuralized" while the analyses of sex and age structure had been "dynamized". The studies in future population size and growth together with sex and age analyses are no doubt one among the most fundamental approaches to the demographic research. They are as well important for economic and social planning, because the information concerning the future population size, growth and sex-age structure is needed for many economic and social projections. They are also the starting point for other projections which altogether form the broad concept of demographic projections.

7. Traditional and analytical demographic projections are a pure demographic device, since they deal only with demographic variables such as fertility, mortality, sex and age composition and the relationships which act inbetween. Social-economic factors impacting the population growth and sex-age structure are considered only in an indirect manner, when working out the assumptions on future fertility, mortality, etc. This holds much more for the psychological factors, whose influence is still a great "unknown" in demographic research.

Perhaps this is the reason why traditional and analytical demographic projections remained for a long time a matter of demography, with relatively little influence on planning.

8. Economic planning has introduced new subjects in demographic projections such as economically active population and its economic and skill structure, estimates of the future educational structure of the population with regards to the labour force requirements, etc. It is very interesting to notice that the early labour force projections had been worked out as a part of economic projections, relating the employment trends only to the growth of the national economy. At the same time the demographic aspects had been neglected to a great extent, what actually prevented the labour force projections to be linked with the population projections. As far as early labour force projections are concerned, due to their economic orientation, they could not be used for estimates of the influence of economic and social progress on the economic and social structure of the population. The same is true, mutatis mutandis for the early forecasts of education whose elaboration was inspired either by the needs for labour force analyses or by the requirements of the educational authorities.

9. More recent demographic projections attempt to assess the place of the population in future economic and social development and to forecast the demographic changes in the light of changing economic and social conditions. They tend to relate the sex and age projections to other kind of partial demographic projections and to incorporate them in national plans for economic and social development. Thus, the scope of recent demographic projections is getting larger in two respects: they cover more demographic topics and are related to the economic and social development programs. Nowadays demographic projections should cover, at least from the theoretical point of view, the following topics:

a) the growth of population, its size and sex and age structure;

b) the growth of the economically active population, its size and the most important structures (sex and age, by occupation and skill, by industry, by social status, etc.);

c) the basic social-economic structures of the total population;

d) the number of households or families, their increase and basic structures (according to the size, social-economic characteristics, etc.);

e) the number of localities, their distribution by size, urban-rural and demographic characteristics.

10. This is in fact in conformity with the scope of modern demography which tends to cover, in addition to the traditional topics new ones which are directly related to the study of population, such as labour force, families, households and localities. However, since the new subjects are not of purely demographic nature, demographic research has to be assisted by other social sciences, in particular by economics, sociology, geography, etc. This is what is actualy wanted, for demographic projections needed for planning cannot neglect the economic, social and other aspects of demographic development.

11. Sex and age projections had been already mentioned so that other projections remain to be briefly discussed. Economically active population or labour force projections are primarily intended to estimate the volume of the labour force and its sex-age distribution. They are usually derived from population projections by using differential economic activity ratios, to be worked out on appropriate assumptions concerning the demographic and economic changes. Their important parts are the forecasts of economic or occupational and social structure of the labour force, which have to be correlated to the development

programmes of various industries and social services. Future requirements for the labour force, various occupations and skill should be studied on the basis of labour force projections, while educational programs have to be adjusted so as to meet the wants of the national economy. Here the projecting work is faced with economic programmes and the type of technology to be used in various industries, on which assumptions concerning the future capital-labour ratios, productivity coefficients, skill composition, etc., have to be estimated. In this respect labour force projections are very important for estimating the rate of economic growth over the future period.

12. Total population economic and social structure forecasts may be worked out on population and labour force projections. This is an important component of demographic projections needed for planning, for population economic and social structure is necessary for future consumption estimates. Due to the different behaviour of various social-economic groups as far as consumption is concerned, realistic estimates of quantity and varieties of consumers' goods can be obtained only if demographic changes are taken into account. For the elaboration of this kind of demographic projection analyses concerning the differential dependency ratios have to be carried out, with the aim of finding out what are the numerical relations between the economically active and inactive population in various social-economic strata. It should be pointed out that in rapid changing societies detailed projections are not recommended owing to the instability of dependency ratios. In such cases it is better to limit the projections to the agriculture-non-agriculture distribution, as well as to the differentiation of groups which belong to the subsistence and monetary economy.

13. Family or household projections should cover both the future number of the households and their composition according to the size, demographic and social-economic characteristics. Their particular value for economic planning is in demand analyses, studies in housing conditions, etc.

14. Future regional and urban-rural distributions may be forecast within the framework of population projections, as global estimates. More precise forecasts have to start, however, from the locality (settlement, agglomeration) and to foresee the changes in population size and structure of the localities according some important classification (urban, rural, classes by size, etc). Different methods can be used for locality analyses, but the most appropriate seems to be the demographic approach. It combines both the locality and population aspects, and suits therefore the demographic projections. It is evident that both household and locality projections have to consider not only the demographic but also the economic and sociological factors influencing the changes in their size and structure.

THE PURPOSE OF DEMOGRAPHIC PROJECTIONS IN PLANNING

15. There are many questions to be studied and answered by demographic projections. Policy decision and targets setting is an outcome of many different analyses and forecasts, in which demographic consideration should have an important role. If planning for economic and social development aims at improving the living conditions of the population and if the selection of objectives and targets should be realistic and adequate, development programs have to take into account both the productive capacity of the population and its requirements concerning consumption, housing, education, health services, etc. On the other hand, to facilitate the implementation of the plans, demographic trends and changes have to be foreseen with the view of avoiding the unnecessary conflicts and disturbances which might occur if economic, social and demographic development would not be synchronized. Finally, when working out the development plans one should be aware of demographic effects produced by their implementation, for demographic changes are as well important for the progress as the economic and social ones.

16. The role of the population in economic and social development and in planning is determined by the fact that population is the basic factor in any kind of production and that all human activity is intended to satisfy the wants of the population. Double capacity of the population as producers and consumers should be the starting point of planning. Since in less advanced countries both capacities of the population are not adequately developed, economic and social plans should shape this development which will gradually improve the present demographic pattern. This holds as well for the size and structure of the labour force as, in long range, for the population, households and settlements. Of course, to achieve a rational demographic development in a developing country is a long-term objective to be fulfilled through gradual and subsequent improvements. But, it should be the guiding idea not only for the long-term development programs. Medium-term programs have also to be inspired by this idea, to gradually create such social-economic conditions which will lead to a sound demographic development.

17. Economic and demographic objectives might coincide in long-range, while in medium-term development they often conflict due to the inadequate resources. Optimum utilization of the resources with regard to achievement of different economic, social and demographic goals, setting up the priorities and phasing the projects seems therefore to be the crucial problem in planning. For this purpose demographic projections are an inevitable component of planning. They are intended to estimate the present and future volume of the national economy in demographic terms, to estimate what is and what will be the productive capacity of the population, to assess what kind of changes in demand and internal market might be expected due to the growth and structural changes of population and households, how the migrations will influence the growth of localities as a consequence of allocation of economic and social services' units, etc.

18. Of course, demographic projections are to be worked out in conformity with the assumptions concerning the economic and social development. Exception should be made for the medium-term projections of growth and sex-age structure of the population, which can be considered as independent projections. However, labour force projections have to be established on assumed availability of saving and other resources, investment and its distribution to various industries, capital or labour intensity of the new investment, changes in productivity, increase in national income, production and social services, and other economic factors involved. Being derived from population and labor force projections other demographic projections have to follow the pattern of economic, social and demographic development also. But, demographic projections should play an active role in elaborating the plans. They should contribute to the philosophy of the plans by evaluating the suitability of the economic programs from the population's point of view and by indicating what is the optimum utilisation of the natural, human and financial resources in the given circumstances.

19. Resources analyses are perhaps one among the most basic fields in planning, where demographic projections have a significant place. Less developed countries duffer from scarcity of capital, dispose of a relatively abundant labour force, while their natural resources are not sufficiently known. In such circumstances investment policy has to be very carefully framed, so as to secure the long-term development and technological progress, fullest possible utilization of labour and the maximum rate of growth. Owing to the structure of the labour force and the mobility of the population, this is not an easy task especially because technical personnel and skilled labour force is lacking. Labour force analyses as well as research in methods of education and training have to suggest how to best utilize the available and perspective labour force with regard to obtaining optimum progress. It should be pointed out that such analyses are not important only from the point of view of economic development. They are important for the future development of the population as well due to the fact that the labour force structure impacts very much the demographic situation in general.

STATISTICAL AND TECHNICAL PROBLEMS

20. It is obvious that demographic analyses and projections needed for planning will require a great deal of statistical data. A complete of statistical system should consist of: (a) population census and (b) vital statistics as recommended by the United Nations, (c) households statistics as recommended by the UN Economic Commission for Europe, or (d) family statistics as produced in some statistically advanced countries, and (e) locality statistics as discussed by the UN ECE Working Group on 1960 population census. This is, indeed, a very ambitious statistical programme which many less developed countries cannot afford. However, it seems that much of the information needed may be obtained by the sample surveys instead of complete census or current vital statistics. The Indian National Sample Survey is perhaps a good enough example how the most important demographic statistics needed for planning can be produced inexpensively.

21. In addition to the demographic statistics some other statistics dealing with the population, such as employment and unemployment statistics, educational statistics, social security statistics, health statistics, etc., should be available. Many developing countries already dispose of such statistics, since they are produced by various Goverment agencies. But. they have to be standardized with the demographic statistics to the extent possible, so as to get an integrated and internally consistent system of statistical information concerning population. Of course, the standardization of various statistics is a difficult and time-consuming work, but it must be undertaken as soon as possible, to obtain an adequate statistical system at an earliest possible date. In Yugoslavia it was necessary to spend almost ten years to get all these statistics standardized to a relatively satisfactory degree. In addition, economic and social statistics and projections have to be available, too. There is no need to point out that these statistics have to be also standardized with demographic and other human statistics.

22. Technical problems related to the demographic projections and analyses cannot be exhausted here due to obvious reasons. But, it should be pointed out that the methods and techniques used for demographic projections have to be standardized as far as possible with the general methodology of planning. At least the following phases in elaboration of the plan have to be distinguished:

a) evaluation of recent economic, demographic and social trends;

b) first approximation of the plan;

c) elaboration of sectorial projections, and

d) integration of sectorial projections and balancing.

It seems that demographic projections regarding the size, growth and sex-age structure have to be worked out independently from the first approximation to the plan. However, sectorial projections and labour-force projections have to be established simultaneously, whereas other demographic projections have to follow this phase, and to be assessed in the framework of the last one.

23. Methods and technique needed for the elaboration of demographic projections are not yet fully developed. Whereas analytical methods used for sex and age projections of the population and methods used for total labour force projections are tested other methods and techniques are in their experimental stage. It seems that some of them suffer from inconsistency and are not properly related to each other. In spite of their deficiency, demographic projections seem to be useful for planning, since they can supply with information not only about the population, labour force, households and localities, but also about the relationships which exist between the population and social-economic development.

SOME YUGOSLAV EXPERIENCE

24. Demographic projections as conceived above are in Yugoslavia very recent due to many factors. Owing to the Second World War the 1941 Population Census has not been carried out, so that the first population data after the war were available only from the 1948 Census. Demographic losses during the war were extremely high and fertility as well as mortality trends disturbed. Therefore pre-war demographic data could not be used for any demographic projections. In addition the 1948 Population Census was a "short" census, without necessary socio-economic characteristics, preventing before 1953 Census any other projections except the total population and sex-age projections. Finally, at the beginning demographic studies were more directed to statistical aspects, while population studies begun only after the 1948 Population Census data were available.

25. Total Population Projections including sex and age structures had been worked out by many agencies and scholars, covering either the whole Yugoslavia and or some of six component republics. Assumptions concerning future fertility and mortality had been worked out according to the available knowledge in various periods. The method used in working out the projections was always the analytical one with some modifications. The following demographic projections of this kind should be mentioned:

a) 1948-1960 projection of Yugoslav and state population; (I. Lah: Population in FPRY in the Period 1948-1960, Statistical Review, 3/4, 1951, pp. 372-392, in Serbo-Croat);

b) 1953-1970 projection of Yugoslav and state population; (Federal Statistical Institute, 1957, mimeographed);

c) 1953-1970 projection of Yugoslav and state population, including school age and active population projections; (Dr. D. Breznik: Observations and Forecasts of Some Categories of the Future Population of Yugoslavia with a Review on Nationality, Statistical Review, 3, 1956, pp. 217-234, in Serbo-Croat);

d) 1961-1981 projection of Yugoslav and state population (Dr D. Breznik).

26. Labour Force Projections as a part of development plans had been worked out by the Federal Planning Institute, particularly for the Second and Third Five Year Plans. The Institute has also undertaken a study of future labour force till 1975, with particular reference to scientific and technical personnel. Other projections in this field are the following:

a) 1953-1959 labour force projection consisting of:

(i) growth of the labour force;

(ii) economic structure of the labour force (distribution by industries);

(iii) needs for and prospective availability of the labour force by level of education;

(iiii) discussion on recent economic and demographic trends as well as the discussion on development anticipated;

(iiiii) discussion on methods and techniques; (M. Macura: Economic Structure Projection of Yugoslav Labour Force and Population, Ekonomist, 1, 1955, pp. 16-44, in Serbo-Croat);

b) 1957-1980 labour force projection covering:

(i) growth of the labour force;

(ii) agricultural-non-agricultural labour force;

(iii) needs for the labour force by level of education;

(iiii) assumed development, investment, etc., till 1980 (Dr M. Macura: L'incidence du facteur démographique sur l'orientation future de l'économie Yugoslave, Ekonomist, 1-2. 1958, pp. 42-59, in Serbo-Croat);

c) 1958-1980 labour force projection as a part of a long-term development study, consisting of forecasts as above, as well as of an estimate of employment in public and private sectors (Dr N. Čobeljić: An Outline of Long-Term Development of the Yugoslav Economy, Ekonomist, 4, 1960, pp. 563-604, in Serbo-Croat).

Assumptions concerning the economic growth in two last projections considerably differ, with the consequence of different forecasts of employment and education.

27. Total Population Economic Structure had been forecast within the frame of three above projections. Whereas the first one estimated total population distribution by industries for 1959, the two projections for 1980 refer only to agricultural and non-agricultural population.

28. Localities and Urban-Rural Population for 1980 was estimated by the Economic Institute of Serbia, for three regions constituting the People's Republic of Serbia. These forecasts together with agricultural and non-agricultural population and labour force estimates are a part of a study concerning the future development of the three regions. The localities had been distributed to 8 size groups and population for each group estimated by using two different assumptions of rate of growth, lower and higher. The number of localities according to the size groups had been estimated also by using the same assumptions. (Economic Institute of Serbia: The Problems of Long-Term Economic Development of Serbia, Beograd, 1960, 4 volumes, in Serbo-Croat, mimeographed).

29. Yugoslav experience seems to cover all the demographic projections discussed in previous paragraphs with the exception of households and families projections. Projections concerning labour force structure, total population structure as well as the locality projections deal with very broad categories for obvious reasons. In addition, methods and techniqs used for various projections seem to be fairly rough and need further improvements. An important problem to be solved is how to integrate the methods and techniques for all kind of projections, since only methods concerning the total population and labour force projections (both growth and structure) had been standardized. So far the existing projections had not been checked up by empirical data. The 1961 Population Census Data together with other statistics may give a good opportunity to scrutinize both the methods and techniques and the estimates of various demographic variables. So, one might expect that future studies in demographic projections' theory, methods and techniques as well as empirical work shall lead to better knowledge of demographic and social-economic relationships in Yugoslavia and to improvement in analytical apparatus.

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